

Original Article

The Story of Women in Neurosurgery in Bangladesh: Overcoming Barriers and Leading Change in a Male-Dominated Field

Ahmed N¹, Ferdousse SNE², Jahan N³, Sultana MS⁴, Afreen S⁵, Zahan KFI⁶, Hamid R⁷

Conflict of Interest:

Funding Agency:

Contribution to Authors: Dr. Nazmin Ahmed

Manuscript Preparation: Dr. Nazmin Ahmed, Dr. Mst. Shamima Sultana

Data Collection: Dr. Syeda Neyamot E Ferdousse, Dr. Nwoshin Jahan, Dr. Samantha Afreen

Editorial Formatting: Dr. Kanij Fatema Ishrat Zahan, Prof. Rezina Hamid

Copyright: ©2022bang. BJNS published by BSNS. This article is published under the creative commons CC-BY-NC license. This license permits use distribution (<https://creativecommons.org/licenses/by-nc/4-0/>) reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

Received: 25 October, 2024

Accepted: 26 November, 2024

Abstract:

Background: Neurosurgery is a traditionally male-dominated field due to various factors such as limited mentorship, lack of role models, and challenges related to childbearing and childcare, which have reduced women's representation. This study aims to analyze career trajectories of female neurosurgeons in Bangladesh, highlighting their achievements, the obstacles they overcame, and the strategies that enabled them to thrive. Their paths will promote women's empowerment and leadership in neurosurgery thus inspire future generations.

Materials and method: This descriptive study analyzed and documented the professional journeys of seven female neurosurgeons who practiced in Bangladesh between 2006 and 2025. Data were compiled from professional biographies, institutional records, and neurosurgical society archives. The study examined key milestones including academic progression, overseas training, leadership roles, participation in international forums, and contributions to neurosurgical education. The analysis focused on identifying the challenges and enabling factors that contributed to their growth as mentors and role models in the field.

Result: As of 2025, Bangladesh has 259 neurosurgeons, of whom only 7 (2.7%) are women. Among them, one serves as a full professor and head of a neurosurgery department. Six (85.7%) have completed overseas fellowships in various neurosurgical subspecialties, and all seven (100%) have participated in international conferences and hands-on surgical workshops abroad. Three (42.9%) currently serve on executive committees of international neurosurgical societies. The number of female neurosurgery residents has shown steady growth, reaching 37 out of 265 (13.96%) in 2025—reflecting increasing interest and access over the past five years.

Conclusion: Despite systemic and societal barriers, these female neurosurgeons in Bangladesh have demonstrated resilience, excellence, and leadership. By breaking longstanding gender barriers, they have become role models for the next generation, both in Bangladesh and globally.

Keywords: Neurosurgeons; Female; Challenges; Empowerment; Bangladesh

Introduction:

Neurosurgery is recognized as one of the most technically demanding and rigorous medical specialties. Globally, the field is heavily male-dominated, with women representing only a small fraction of the neurosurgical workforce (1,2). According to a 2020 global survey by the World Federation of Neurosurgical Societies (WFNS), women account for less than 12% of practicing neurosurgeons worldwide, with even lower representation in leadership positions and

academic neurosurgery (3,4). The underrepresentation might be due to a combination of structural and sociocultural barriers, limited mentorship, lack of role models, gender bias in surgical training environments, and challenges related to balancing professional and family responsibilities including childbearing and childcare. These barriers also contribute to slower career progression and fewer opportunities (5,6,7).

1. Dr. Nazmin Ahmed, MS, Assistant Professor & Associate Consultant, Department of Neurosurgery, Ibrahim Cardiac Hospital & Research Institute (A Centre for Cardiovascular, Neuroscience & Organ Transplant Units), Shahbag, Dhaka, Bangladesh-1000. Email: nazmin.bsmmu@gmail.com
2. Dr. Syeda Neyamot E Ferdousse, MS, Medical Officer, Department of Neurosurgery, National Institute of Neurosciences and Hospital, Agargaon, Dhaka, Bangladesh- Email: snferdouse@gmail.com
3. Dr. Nwoshin Jahan, MS, Major, Department of Neurosurgery, Combined Military Hospital, Dhaka, Bangladesh Email: nwoshinreta@gmail.com
4. Dr. Mst. Shamima Sultana, MS, Associate Professor, Department of Neurosurgery, Rangpur Medical College Hospital, Rangpur, Bangladesh Email: shamimaneuro@gmail.com
5. Dr. Samantha Afreen, MS, Major, Department of Neurosurgery, Combined Military Hospital, Dhaka, Bangladesh Email: samanthaafreen9@gmail.com
6. Dr. Kanij Fatema Ishrat Zahan, MS, Associate Professor, Department of Neurosurgery, Dhaka Medical College Hospital, Dhaka, Bangladesh Email: kfzrifat@gmail.com
7. Prof. Rezina Hamid, MS, Professor and Head of the Department of Neurosurgery, Bangladesh Medical College, Dhaka, Bangladesh Email: rezina.hamid@gmail.com

Corresponding author:

Dr. Nazmin Ahmed, MS, Assistant Professor & Associate Consultant, Department of Neurosurgery, Ibrahim Cardiac Hospital & Research Institute (A Centre for Cardiovascular, Neuroscience & Organ Transplant Units), Shahbag, Dhaka, Bangladesh-1000. Email: nazmin.bsmmu@gmail.com Phone: 01798625387 ORCID:0000-0002-6308-8498

The gender diversity in neurosurgery has clinical and academic importance. Studies have shown that diverse surgical teams can enhance decision-making, improve patient communication, and contribute to more inclusive research and education environments (8,9,10). Gender diversity also plays an important role in mentorship, new professionals, broader role models and support. However, women in neurosurgery often face barriers including gender discrimination towards job facility, scholarships, international training, and leadership, especially in low- and middle-income countries (LMICs). Research from LMICs has highlighted how these constraints can limit women’s visibility, impact professional development. In such contexts, a small number of women have managed to enter and persist in this field (11,12,13).

In Bangladesh, the representation of women in neurosurgery is extremely limited. While recent years have seen encouraging progress globally and to some extent nationally in the number of women entering neurosurgical training (14,15,16). However, there is a noticeable lack of published data or scholarly documentation on the status, challenges, and contributions of women in neurosurgery in the country. In the context of a Muslim-majority, developing nation like Bangladesh, cultural expectations, limited institutional support, and gendered professional norms can create unique barriers to entry and progression in surgical disciplines. Documenting the professional journeys of the country’s few female neurosurgeons will not only recognize their individual achievements but also to guide others in achievements, mentorship, and leadership. Understanding the specific barriers these women have faced alongside the factors that enabled their success will encourage more women to pursue neurosurgery. Thus, this study aims to document and analyze the professional journeys of female neurosurgeons in Bangladesh between 2006 and 2025, highlighting their career trajectories, international exposure, leadership roles, academic contributions, and the challenges they have overcome.

Materials and method

This is a descriptive study to document and analyze the professional journeys of female neurosurgeons practicing in Bangladesh between 2006 and 2025. The study identified female neurosurgeons were through national neurosurgical society records, hospital directories, and academic networks. Their profiles were compiled using a combination of primary and secondary sources, including professional biographies, institutional records, publicly available interviews, published conference abstracts, and relevant documents from the Bangladesh Society of Neurosurgeons (BSNS).

The study focused on capturing major career milestones, such as medical and neurosurgical training, academic progression, overseas fellowships, participation in international conferences and workshops, leadership roles in national or international forums, and academic or clinical contributions to neurosurgical development in Bangladesh. Data extraction was guided by a structured matrix to ensure consistency across profiles and thematic comparability. The matrix included categories such as: Demographics and training background; Timeline of neurosurgical education and qualifications; Academic and institutional appointments; Subspecialty training or fellowships abroad; Involvement in neurosurgical education and mentoring; Leadership and society memberships; Reported challenges and enabling factors.

In addition, data on female representation in neurosurgical residency programs in Bangladesh over time were obtained from the national postgraduate medical education authority and training institutes. Descriptive statistics were used to report proportions and trends. Ethical approval was not required for this study as it relied on publicly available and institutionally approved data without involving patient records or human subject interviews.

Result

Gender Distribution of Neurosurgeons

Analysis of the gender distribution among practicing neurosurgeons in Bangladesh reveals significant disparity (Figure 1). Out of 259 neurosurgeons, only 7 are women, comprising 2.7% and male-to-female ratio of 36:1 indicates significant underrepresentation of women.

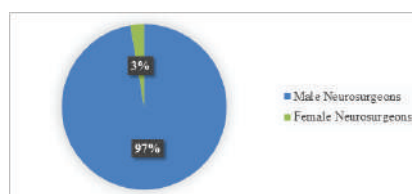


Figure 1: Ratio of male and female neurosurgeons in Bangladesh.

Trends in Female Neurosurgery Residents

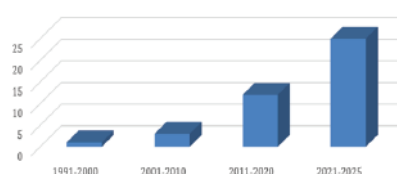


Figure 2. Number of Female Neurosurgery Residents in Bangladesh (1991–2025)

Trends in residency enrollment indicates gradual progress in recent decades. From 1991 to 2000, only one female candidate entered neurosurgical training programs in Bangladesh. Between 2001 and 2010, the number increased slightly to three. However, a notable shift occurred in the following decade, with 15 women enrolling between 2011 and 2020. This upward trend continued in the most recent five-year period, with 25 female residents documented between 2021 and 2025. In total, 37 out of 265 residents in 2025 were women, indicating a growing interest in neurosurgical careers among Bangladeshi women (Figure 2 & Figure 3).



Figure 3: Photograph showing 5 female Neurosurgeons, in front row and a glimpse of female neurosurgery residents standing behind (Photograph taken after ‘WIN Session’ in 4th ACNS Interim Meeting, 2025 at Hotel Intercontinental, Dhaka, Bangladesh).

Academic Training, Workshops, and Fellowships

In terms of training and academic exposure, Bangladeshi female neurosurgeons have demonstrated diversified expertise. Their contributions are seen in a broad range of advanced domains, including pediatric neurosurgery, neuro-oncology, spine surgery, neuro-endoscopy, and hybrid vascular neurosurgery. Notably, Prof. Rezina Hamid was the first female neurosurgeon in Bangladesh to pursue a pediatric neurosurgery fellowship abroad that inspired others to engage in further sub-specialization. Subsequent female neurosurgeons have participated in numerous prestigious international training programs. These include fellowships such as CURE’s neuro-fellowship programme in Uganda (2008), a neuro-endoscopy fellowship at NSCB Government Medical College in Jabalpur, India (2018), a hybrid vascular neurosurgery fellowship at Fujita Health University in Japan (2024), and a neuro-oncology fellowship at the National University Hospital in Singapore (2025). Additionally, they have taken part in a variety of workshops covering microvascular anastomosis, skull base surgery, percutaneous endoscopic approaches, and neuro-spinal procedures in institutions across Japan, India, and Bangladesh (Table: 1, Figure: 4).

Table 1. International fellowships and hands-on workshops attended by female neurosurgeons from Bangladesh

Year	Training Type	Title/Fellowship	No. of Participants	Venue	Mentor
2008	Fellowship	CURE’s Neurofellowship Programme	1	CURE Children’s Hospital, Uganda	Prof. Benjamin C. Warf
2008	Workshop	Endoscopic Neurosurgery	1	AACNS, Nagoya, Japan	
2015	Workshop	Microvascular Anastomosis	1	DMCH, Dhaka, Bangladesh	
2016	Workshop	Skull Base Surgery	1	DMCH, Dhaka, Bangladesh	
2016	Workshop	Percutaneous Endoscopic F & D	1	NINS, Dhaka, Bangladesh	
2017	Workshop	Neurospine	1	BMMU (BMU), Dhaka, Bangladesh	
2018	Fellowship	Neuroendoscopy	2	NSCB Govt. Medical College, Jabalpur, India	Prof. Y. R. Yadav
2018	Workshop	Skull Base Surgery	1	DMCH, Dhaka, Bangladesh	
2022	Workshop	Neurovascular Workshop	1	Burn & Plastic Surgery, DMCH, Dhaka, Bangladesh	
2022	Workshop	Skull Base Surgery	1	Anatomy Dissection Hall, DMC, Dhaka, Bangladesh	
2023	Workshop	Neurovascular Workshop	2	National Institute of Burn & Plastic Surgery, DMCH, Dhaka	
2024	Fellowship	Hybrid Vascular Neurosurgery	2	Fujita Health University, Bantane, Japan	Prof. Yoko Kato
2024	Workshop	Microvascular Anastomosis	2	National Institute of Burn & Plastic Surgery, DMCH, Dhaka	
2025	Fellowship	Neuro-oncology	1	National University Hospital, Singapore	Prof. Diong Weng Vincent Nga

Subspecialty Practice and Clinical Roles

The clinical practice of our female neurosurgeons reflects their specialized training and evolving professional interests. Currently, they are actively contributing to service delivery in a wide range of neurosurgical subspecialties, including hybrid vascular procedures, endoscopic tumor surgeries, spine and navigation-guided surgeries, and pediatric neurosurgical care. Their integration into these complex surgical domains indicates their individual competencies and role in highly technical subspecialties that were historically dominated by men (Figure 5).



Figure 4. Photographic documentation of international fellowships and hands-on training attended by Bangladeshi female neurosurgeons.



Figure 5: Female neurosurgeons of Bangladesh practicing in subspecialties including pediatric neurosurgery, vascular neurosurgery, tumor surgery, spine surgery, and neuro-navigation guided surgery.

Representation in International Seminars and conferences

Bangladeshi female neurosurgeons growing academic engagement is evidenced by their participation in international neurosurgical forums. They have presented at prominent platforms such as the World Federation of Neurosurgical Societies (WFNS) Congress, WFNS Symposia and the Asian Congress of Neurological Surgeons (ACNS) Interim Meetings. They have been featured as speakers, session chairs, and workshop, demonstrating their scholarly contributions and strengthening the country’s representation in global neurosurgical discourse (Figure 6).



Figure 6. Participation of female neurosurgeons from Bangladesh in international seminars, symposia, and surgical workshops.

Academic Contributions, Research, and Professional Affiliations

Despite the absence of assessment of research productivity among female neurosurgeons in Bangladesh, several have demonstrated commendable academic output. They have published research papers in peer-reviewed international journals, contributed to textbook chapters, and engaged in medical illustration (19-29).

One significant achievement was their involvement in the first internationally published textbook on neurosurgery originating from Bangladesh, titled Principles of Neurosurgery: A Concise Text, co-edited by eminent neurosurgeons from Bangladesh and the United Kingdom (19). Their academic recognition is further reinforced by active memberships in prestigious global societies. Prof. Rezina Hamid serves as a committee member in both the WFNS Liaison Committee and the International Federation for Spina Bifida and Hydrocephalus. Dr. Mst. Shamima Sultana and Dr. Nazmin Ahmed are committee members of the Young Neurosurgeons Section of the Asian Congress of Neurological Surgeons. These appointments signify the leadership roles of female neurosurgeons from Bangladesh, have contributing in international neurosurgical initiatives and policymaking (Table: 2).

Table 2. Executive Committee Membership of Female Neurosurgeons in International Neurosurgical Societies

Name	International Society	Role
Prof. Rezina Hamid	WFNS Liaison Committee / WHO	Committee Member
	International Federation for Spina Bifida & Hydrocephalus	Committee Member
Dr. Mst. Shamima Sultana	Asian Congress of Neurological Surgeons - YNS Committee	Committee Member
Dr. Nazmin Ahmed	Asian Congress of Neurological Surgeons - YNS Committee	Committee Member

Enablers and challenges

Several key enabling factors facilitated the entry and progression of female neurosurgeons in the field. All participants had a strong motivation and early passion for surgical disciplines, particularly neuroscience, which they developed during medical school. The foundational interest served as internal driver throughout their academic and professional journeys. In addition to personal commitment, supportive family environments, encouragement from parents and spouses played important role to overcome cultural and logistical difficulties. Many noted that familial backing was vital in allowing them to pursue lengthy training and demands of the neurosurgical profession. Mentorship was also another significant enabler. Being guided by senior male faculty members who recognized their talent and provided encouragement during training. These mentors played important role in opening pathways for career advancement, particularly in the absence of senior female figures within the discipline. Many female patients, especially in conservative or rural settings, preferred to be treated by women surgeons, creating clinical demand for female neurosurgeons. In some cases, the mere presence of a woman in the operating theater was seen as balancing gender dynamics and improving the comfort of patients and surgical teams.

However, significant number of barriers including systemic and interpersonal discrimination were common across medical school and residency. Many experiencing gender-based stereotypes, such as being perceived as physically less capable of handling long or complex surgeries. Some senior colleagues, reflecting entrenched gender biases, emphasized strength over skill and expressed skepticism regarding women's suitability for the field. These attitudes created additional psychological burdens for women attempting to prove their worth in already demanding clinical environments. The absence of senior female role models also increase their challenges. Most participants described a lack of mentorship from women who had previously faced similar paths. As a result, they often had to figure out critical aspects of professional conduct and social issues. Balancing personal and professional responsibilities is another important challenge. Female neurosurgeons were frequently questioned about their family related plans during job postings and evaluations hampered their family life and parenthood in order to meet the demands of their surgical training and career milestones. For those training or working in departments with few or no women, feelings of isolation, particularly during the early stages of careers.

Discussion

This study presents the first systematic documentation of the professional journeys of female neurosurgeons in Bangladesh, an area that remains male-dominated both globally and nationally. Although the total number of neurosurgeons in the country has grown in recent decades, women's participation continues to lag, with only 2.7% of the current neurosurgical workforce being female. This gender disparity mirrors global trends, where women comprise less than 12% of practicing neurosurgeons, and even fewer hold leadership or academic positions within the field (1–4).

Despite these systemic challenges, the gradual increase in the number of female neurosurgery residents in Bangladesh over the past two decades signals a shift toward greater gender inclusivity. By 2025, the total number of female residents reached 37, indicates a growing interest among women in pursuing this specialty. This upward trend aligns with global efforts to promote gender equity in surgical disciplines that diverse surgical teams improve patient care, enhance clinical decision-making, and enrich educational outcomes (8–10).

A particularly notable finding of this study is the extent of international training pursued by Bangladeshi female neurosurgeons. These professionals have secured fellowships in Uganda, Japan, India, and Singapore, and actively participated in specialized workshops covering neurovascular, endoscopic, and skull base surgery.

Their pursuit of subspecialization in pediatric neurosurgery, neuro-oncology, spine surgery, and vascular neurosurgery demonstrates a high level of professional dedication and a significant contribution to advancing national neurosurgical capacity. Furthermore, their academic presence at international forums such as the WFNS and ACNS highlights a growing leadership role and scholarly visibility on the global stage.

These achievements, however, were often attained in the face of entrenched gender-based barriers. Echoing studies from other low- and middle-income countries (LMICs), Bangladeshi women in neurosurgery reported encountering deep-rooted biases that questioned their physical stamina, technical competence, and emotional resilience (11–13). Senior faculty frequently emphasized physical strength over surgical skill, adding psychological strain during training. The absence of senior female mentors further compounded these difficulties, leaving many women to face complex professional and social landscapes without adequate guidance.

Balancing professional responsibilities with societal expectations around family and caregiving emerged as a recurrent challenge. Many respondents reported facing inappropriate inquiries about marriage and motherhood during job interviews and evaluations. Cultural expectations for women to prioritize caregiving, coupled with inflexible institutional structures, often led to delays in personal milestones such as marriage or parenthood. These findings echo global research suggesting that women in neurosurgery are less likely than men to be married, have children, or attain leadership roles (15–16). Nevertheless, mentorship by senior male neurosurgeons played an enabling role in some cases. Additionally, the preference among many female patients particularly in conservative or rural settings for women surgeons served to both validate and increase the demand for female presence in operating rooms (17–18).

Encouragingly, Bangladeshi women in neurosurgery are not only shaping clinical practice but also making significant contributions to academic leadership. Their involvement in medical publishing, textbook authorship, surgical illustration, and committee roles within international neurosurgical societies is a noteworthy achievement in a historically exclusive domain. Representation in leadership bodies such as the WFNS Liaison Committee and the ACNS Young Neurosurgeons' Section shows the potential for women from LMICs to lead transformative change in neurosurgery at both national and international levels (19–21).

In the Bangladeshi context, where caregiving and household responsibilities are predominantly assigned to women, many aspiring female neurosurgeons are either dissuaded from entering the field or redirected toward less demanding specialties.

A related survey among female neurosurgeons in India found that over 70% faced direct discouragement from pursuing neurosurgery, often from established neurosurgeons themselves. Key deterrents included fears of gender discrimination and challenges in balancing training with personal responsibilities. Female neurosurgeons in LMICs are also disproportionately more likely to remain unmarried and childless than their male counterparts (22–27). Compounding these challenges, some studies suggest that female residents face higher rates of pregnancy complications, adding another layer of complexity to their training experience. While all neurosurgical trainees face long hours and emotional strain, women often bear additional burdens related to pregnancy, childbirth, and early parenting.

Post-residency career development presents further obstacles. Women neurosurgeons frequently encounter limited access to subspecialty training, fewer fellowship placements, and systemic inequities in pay, research funding, and academic promotion. Family responsibilities, particularly childcare, often limit the ability to pursue long-term research or advanced clinical training. Moreover, enduring societal stereotypes continue to portray women as less “suitable” for surgical roles, based on outdated perceptions of physical fragility and emotional vulnerability. Many female neurosurgeons report having to work harder than their male counterparts to gain professional respect and equal recognition, facing skepticism not only from peers but also from patients (28–29). The findings of this study indicate the need for institutional reforms and establish equity in neurosurgical training and practice in Bangladesh. Finally, documenting and amplifying the stories of these women can inspire the next generation, catalyze cultural and institutional change within the broader medical profession.

Conclusion

The professional journeys of female neurosurgeons in Bangladesh reveal a powerful narrative of perseverance, excellence, and leadership in the face of systemic and societal barriers. While their numbers remain small, their achievements in clinical care, academic leadership, and international engagement reflect meaningful progress toward a historically male-dominated field. Sustained institutional support, structured mentorship, and inclusive policies are essential to ensure that the next generation of women in neurosurgery can thrive and lead.

Acknowledgement

We are grateful to our teachers, mentors, colleagues for their continuous support and guidance. Notably, Prof. Yoko Kato whose tireless effort to expand the neurosurgical training and education programme in Bangladesh worth mentioning.

References

1. Lulla T. Women in neurosurgery: Why is the field still male-dominated? [Internet]. *NeuroNews International*. 2023 Jan 20 [cited 2025 Jun 3]. Available from: <https://neuronewsinternational.com/women-in-neurosurgery-why-is-the-field-still-male-dominated/>
2. Cavallo SM, Pellencin E, Carone G, Castelli N, Ayadi R, Oildashi F, Al Anazi A, Kanaan I, Colmena FG, Ajler P, Socolovsky M. Non-technical skills for neurosurgeons: An international survey. *Brain and Spine*. 2024 Jan 1;4:102923.
3. Renfrow JJ, Rodriguez A, Wilson TA, Germano IM, Abosch A, Wolfe SQ. Tracking career paths of women in neurosurgery. *Neurosurgery*. 2018 Apr 1;82(4):576-82.
4. Gnanakumar S, Bourquin BA, Robertson FC, Solla DJ, Karekezi C, Vaughan K, Garcia RM, Hassani FD, Alamri A, Höhne J, Menri N. The world federation of neurosurgical societies young neurosurgeons survey (Part I): demographics, resources, and education. *World neurosurgery*: X. 2020 Oct 1;8:100083.
5. Shi HH, Westrup AM, O'Neal CM, Hendrix MC, Dunn IF, Gernsback JE. Women in neurosurgery around the world: a systematic review and discussion of barriers, training, professional development, and solutions. *World neurosurgery*. 2021 Oct 1;154:206-13.
6. Thum JA, Chang D, Tata N, Liao LM. Neurosurgeons in 2020: the impact of gender on neurosurgical training, family planning, and workplace culture. *Neurosurgical focus*. 2021 Mar 1;50(3):E11.
7. Garozzo D, Rispoli R, Graziano F, et al. Women in Neurosurgery: Historical Path to Self-Segregation and Proposal for an Integrated Future. *Front Surg*. 2022;9:908540. Published 2022 Jun 28.
8. Lewis JE, Pride LC, Luk HG, Oyejide K, Wilson IM, Tawiah WE, Watkins CM, Lee WC. Aligning our actions with our words: A systematic review of gender and racial diversity in surgical subspecialties. *The Journal of Medicine Access*. 2024 Oct;8:27550834241293022.
9. Gabriel PJ, Alexander J, Kärkliņa A. Diversity in neurosurgery: trends in gender and racial/ethnic representation among applicants and residents from US neurological surgery residency programs. *World Neurosurgery*. 2021 Jun 1;150:e305-15.
10. Dejenie R, Fannon EE, Persky J, Gaeta E, Soufi K, Howard B, Stadel KM, Godoy LA. Dissecting diversity: a comprehensive look at the present landscape and future challenges in surgical specialties. *Journal of Surgical Education*. 2024 May 17.

11. Ceylan M, Mnzile JY. The Impact of Mentorship and Sponsorship on Women's Career Development. In *Cultivating Creativity and Navigating Talent Management in Academia 2025* (pp. 429-448). IGI Global Scientific Publishing.
12. Dixon A, Silva NA, Sotayo A, Mazzola CA. Female medical student retention in neurosurgery: a multifaceted approach. *World Neurosurgery*. 2019 Feb 1;122:245-51.
13. Odonkor MN, Pahwa B, Rincon-Torroella J, Abu-Bon-srah N, Yenokyan G, Dada OE, Goodwin CR, Huang J, Groves ML. Effects of Gender and Country of Training on Perceived Access to Opportunities for Neurosurgical Research and Gender-Concordant Mentorship. *World neurosurgery*. 2025 Jan 1;193:492-510.
14. Alam EB, Haque MA, Towhid MI, Khan MM, Fatema K, Salwa M, Haseen F, Paul BK. Gender and other factors influencing the specialty choice among postgraduate medical students in Bangladesh, 2016-2020. *Bangabandhu Sheikh Mujib Medical University Journal*. 2023 Sep 27;16(3):152-9.
15. Kanmounye US, Ghomsi NC, Djiofack D, Tétinou F, Nguembu S, Zolo Y, Esene I. The implications of global neurosurgery for low-and middle-income countries: the case of Cameroon. *Iranian Journal of Neurosurgery*. 2020 Apr 10;6(2):93-100.
16. Wireko AA, Ahluwalia A, Ali SH, Shah MH, Aderinto N, Banerjee S, Roy S, Ferreira T, Tan JK, Berjaoui C, Guggilapu S. Insights into craniosynostosis management in low-and middle-income countries: A narrative review of outcomes, shortcomings and paediatric neurosurgery capacity. *SAGE Open Medicine*. 2024 Jan;12:20503121241226891.
17. Koutsouras GW, Zhang L, Zanon N, Lam S, Boop FA, Tovar-Spinoza Z. Equity in neurosurgery: a worldwide survey of women neurosurgeons. *Journal of neurosurgery*. 2022 Jul 29;138(2):550-8.
18. Shah A. Women in neurosurgery—the road less traveled. *Neurology India*. 2022 Jul 1;70(4):1340-3.
19. Chowdhury FH, Sarker MH, Haque MR, Kawsar KA, Rumi JU, editors. *Principles of Neurosurgery: A Concise Text*. MDPI; 2024 Dec 30.
20. Neyamot-e-Ferdousi S, Arifin MS, Haque MR, Chowdhury FH. Idiopathic Intracranial Hypertension (IIH). *Principles of Neurosurgery: A Concise Text*. 2024 Dec 30:105.
21. Chowdhury FH, Haque R, Neyamot-e-Ferdousi S, Islam R, Rahman MB. CSF Fistula. *Principles of Neurosurgery: A Concise Text*. 2024 Dec 30:115.
22. Ahmed N. Neural Plasticity and functional recovery. In *Rehabilitation in Neurotrauma: Current concepts, Practices and Recommendations 2022* July 8. Nova Science Publishers.
23. Ahmed N, Khan MS, Ahsan MK. Pott's Paraplegia. In *Paraplegia-New Insights 2022* Oct 13. IntechOpen.
24. Ahmed N. Management of High-Grade Meningioma: Present, Past and Promising Future. In *Central Nervous System Tumors-Primary and Secondary 2022* Nov 6. IntechOpen.
25. Alam S, Chowdhury FH, Ahmed N, Sarker MH. Cerebral Arteriovenous Malformation (AVM). *Principles of Neurosurgery: A Concise Text*. 2024 Dec 30:257.
26. Chowdhury FH, Alam S, Ahmed N, Haque MR. Cerebral Arteriovenous (AV) Fistula. *Principles of Neurosurgery: A Concise Text*. 2024 Dec 30:269.
27. Alam S, Chowdhury FH, Ahmed N, Hye MA, Haque MR. Subarachnoid Hemorrhage and Intracranial Aneurysm. *Principles of Neurosurgery: A Concise Text*. 2024 Dec 30:223.
28. Chowdhury FH, Alam S, Ahmed N, Haque MR. Caroticocavernous Fistula (CCF). *Principles of Neurosurgery: A Concise Text*. 2024 Dec 30:278.
29. Alam S, Chowdhury FH, Ahmed N, Sarker MH. Cerebral Cavernous Malformation (CCM). *Principles of Neurosurgery: A Concise Text*. 2024 Dec 30:8:283.